REMARKS

Claims 1-4, 7-15, 18-22 and 24-25 are pending in the present application. Applicants respectfully request reconsideration of the application in view of the above amendments and remarks made herein.

I. Rejections Under 35 U.S.C. § 103

Claims 1-2, 4, 10, 12-13, 15 and 21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *McCanne* (US 2003/0088696) in view of *Haas et al.* (US 7,035,937), in further view of *O'Toole et al.* (US 7,185,077).

Claims 1 and 12 claim, *inter alia*, "constructing a reduced overlay distribution graph having a minimum available bandwidth greater than the target bandwidth by iteratively removing an edge from a current overlay distribution graph, beginning with the fully connected overlay distribution graph, the edge having a bandwidth less than or equal to the target bandwidth."

McCanne teaches methods for controlling packet flow through points of bandwidth constraint specified by external policies (see paragraph [0044]). The Examiner concedes that *McCanne* does not teach or suggest constructing a reduced overlay distribution graph having a minimum available bandwidth greater than the target bandwidth by iteratively removing an edge from the fully connected overlay distribution graph having a bandwidth less than or equal to the target bandwidth (see page 8 of the Office Action). Therefore, *McCanne* fails to teach or suggest all of the limitations of Claims 1 and 12.

Haas teaches a routing protocol for an ad hoc network that employs alternate tree computation algorithms that continually compute backup trees that can be employed to replace

failed trees (see Abstract). The Examiner concedes that *Haas* does not teach or suggest

constructing a reduced overlay distribution graph having a minimum available bandwidth greater

than the target bandwidth by iteratively removing an edge from the fully connected overlay

distribution graph having a bandwidth less than or equal to the target bandwidth (see page 8 of the

Office Action). Thus, *Haas* fails to cure the deficiencies of *McCanne*.

O'*Toole* teaches comparing network metrics for subsets of nodes to determine if

reconnection of a node to a different parent node in the network will improve performance (see

col. 7, lines 44-50). O'*Toole* does not teach or suggest "constructing a reduced overlay

distribution graph having a minimum available bandwidth greater than the target bandwidth by

iteratively removing an edge from a current overlay distribution graph, beginning with the fully

connected overlay distribution graph, the edge having a bandwidth less than or equal to the target

bandwidth" (emphasis added) as claimed in Claims 1 and 12. In O'*Toole*, a reconnecting node

measures the bottleneck bandwidth between various subsets of nodes. These bottleneck

bandwidths are then compared, and the reconnecting node chooses the subset having the higher

bottleneck bandwidth (see col. 14, lines 42-62 and FIG. 5). That is, O'*Toole* does not determine

or utilize a target bandwidth, much less construct a reduced overlay distribution graph, essentially

as claimed in Claims 1 and 12. Rather, O'*Toole* compares the respective bandwidths of various

subsets of nodes and chooses the subset providing the highest bandwidth. This process is

illustrated in FIG. 5 (see also col. 14, lines 23-62). In FIG. 5, node 62F is a reconnecting node

that is initially connected to node 62E via connection 44-3. Upon determining that the

performance through connection 44-3 has declined, reconnecting node 62F initiates a process to

find a better connection. To find this new connection, O'*Toole* uses a selection approach based

on a lineage group (see col. 14, lines 38-40). The selection approach used in O'*Toole* bears no

resemblance to the claimed reduced overlay distribution graph constructed in Claims 1 and 12. Using the selection approach, reconnecting node 62F essentially looks to its ancestor nodes to see if a more efficient connection can be made using the ancestor nodes. If a more efficient connection exists, the current connection is terminated and is replaced with the newer, more efficient connection (see FIG. 5; connection 44-3 is replaced with connection 44-4). Thus, any overlay would have the same size, e.g., number of edges. Replacement of connections is clearly not analogous to constructing a reduced overlay distribution graph by iteratively removing an edge, essentially as claimed in Claims 1 and 12. Therefore, *O'Toole* fails to cure the deficiencies of *McCanne* and *Haas*.

The combination of *McCanne*, *Haas* and *O'Toole* teaches methods for controlling packet flow through points of bandwidth constraint specified by external policies, a routing protocol for an ad hoc network that employs alternate tree computation algorithms that continually compute backup trees that can be employed to replace failed trees, and comparing network metrics for subsets of nodes to determine if reconnection of a node to a different parent node in the network will improve performance. The combination does not teach or suggest "constructing a reduced overlay distribution graph having a minimum available bandwidth greater than the target bandwidth by iteratively removing an edge from a current overlay distribution graph, beginning with the fully connected overlay distribution graph, the edge having a bandwidth less than or equal to the target bandwidth" as claimed in Claims 1 and 12. Accordingly, the combination does not teach or suggest all of the limitations of Claims 1 and 12.

Therefore, for at least the reasons above, Claims 1 and 12 are believed to be patentable and non-obvious over the combination of *McCanne, Haas* and *O'Toole*. Applicants respectfully submit that inasmuch as Claims 2, 4, 10, 13, 15 and 21 are dependent on Claims 1 and 12, and Claims 1 and 12 are patentable over the cited references, Claims 2, 4, 10, 13, 15 and 21 are patentable as dependent on independent claims. Reconsideration of the instant rejection is respectfully requested.

Claims 3, 11, 14 and 22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *McCanne* in view of *Haas*, in further view of *O'Toole*, in further view of *Silton et al.* (US 6,327,252).

Claims 3, 11, 14 and 22 depend from Claims 1 and 12, and are believed to be allowable for at least the reasons given for Claims 1 and 12. Reconsideration of the instant rejection is respectfully requested.

Claims 7-9 and 18-20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *McCanne* in view of *Haas*, in further view of *O'Toole*, in further view of *Hsu* (6,363,319), in further view of *Grover et al.* (US 2002/0187770).

Claims 7-9 and 18-20 depend from Claims 1 and 12, and are believed to be allowable for at least the reasons given for Claims 1 and 12. Reconsideration of the instant rejection is respectfully requested.

Referring to new Claim 24; Claim 24 depends from Claim 1 and is believed to be allowable for at least the reasons given for Claim 1. Claim 24 is further believed to be allowable for additional reasons.

Claim 24 claims the computer-implemented method of claim 1, "wherein the removed edge is not replaced in the current overlay distribution graph."

McCanne teaches methods for controlling packet flow through points of bandwidth constraint specified by external policies (see paragraph [0044]). The Examiner concedes that *McCanne* does not teach or suggest constructing a reduced overlay distribution graph having a minimum available bandwidth greater than the target bandwidth by iteratively removing an edge from the fully connected overlay distribution graph having a bandwidth less than or equal to the target bandwidth (see page 8 of the Office Action). Thus, it follows that *McCanne* does not teach or suggest "wherein the removed edge is not replaced in the current overlay distribution graph" as claimed in Claim 24. Therefore, *McCanne* fails to teach or suggest all of the limitations of Claim 24.

Haas teaches a routing protocol for an ad hoc network that employs alternate tree computation algorithms that continually compute backup trees that can be employed to replace failed trees (see Abstract). The Examiner concedes that *Haas* does not teach or suggest constructing a reduced overlay distribution graph having a minimum available bandwidth greater than the target bandwidth by iteratively removing an edge from the fully connected overlay distribution graph having a bandwidth less than or equal to the target bandwidth (see page 8 of the Office Action). Thus, it follows that *McCanne* does not teach or suggest "wherein the removed

edge is not replaced in the current overlay distribution graph" as claimed in Claim 24. Therefore, *Haas* fails to cure the deficiencies of *McCanne*.

O'Toole teaches comparing network metrics for subsets of nodes to determine if reconnection of a node to a different parent node in the network will improve performance (see col. 7, lines 44-50). *O'Toole* does not teach or suggest removing an edge from an overlay distribution graph, wherein the removed edge is not replaced in the current overlay distribution graph, essentially as claimed in Claim 24. Indeed, in *O'Toole*, an edge is <u>only</u> removed if is going to be replaced with a new edge. For instance, referring to FIG. 5 of *O'Toole*, node 62F is initially connected to node 62E (see also col. 14, lines 38-65). Node 62F first creates subsets of nodes based on parent node 62E and grandparent node 62D. Node 62F then uses these subsets to determine a path of edges having a highest bottleneck bandwidth. <u>Only upon establishing a new path of edges with a higher bandwidth is the existing edge removed</u> (see col. 14, lines 57-62). This is illustrated in FIG. 5 where edge 44-3 is only removed upon determining that a replacement edge, edge 44-4, has a higher bandwidth. In view of the foregoing, *O'Toole* fails to cure the deficiencies of *McCanne* and *Haas*.

The combination of *McCanne*, *Haas* and *O'Toole* teaches methods for controlling packet flow through points of bandwidth constraint specified by external policies, a routing protocol for an ad hoc network that employs alternate tree computation algorithms that continually compute backup trees that can be employed to replace failed trees, and comparing network metrics for subsets of nodes to determine if reconnection of a node to a different parent node in the network will improve performance. The combination does not teach or suggest that a "removed edge is

not replaced in the current overlay distribution graph" as claimed in Claim 24. Accordingly, the combination does not teach or suggest all of the limitations of Claim 24.

Referring to new Claim 25; Claim 25 claims limitations substantially similar to the limitations of Claim 1, and is believed to be allowable for at least the reasons given for Claim 1. Claim 25 is further believed to be allowable for additional reasons.

Claim 25 claims, *inter alia*, "defining a target bandwidth having a value equal to half a sum of a minimum link bandwidth and a maximum link bandwidth of edges of the overlay spanning tree given a fully connected overlay distribution graph" (emphasis added).

McCanne teaches bandwidth constraints specified by external policies (see paragraph [0033], lines 12-17). *McCanne* does not teach or suggest "defining a target bandwidth having a value equal to half a sum of a minimum link bandwidth and a maximum link bandwidth of edges of the overlay spanning tree given a fully connected overlay distribution graph" as claimed in Claim 25. Indeed, other than stating that the bandwidth constraints are specified by "external policies," *McCanne* never discusses the value of these bandwidth constraints or how the constraints are determined. Therefore, *McCanne* does not teach or suggest all of the limitations of Claim 25.

Haas teaches a routing protocol for an ad hoc network that employs alternate tree computation algorithms that continually compute backup trees that can be employed to replace failed trees (see Abstract). *Haas* does not teach or suggest "defining a target bandwidth having a value equal to half a sum of a minimum link bandwidth and a maximum link bandwidth of edges of the overlay spanning tree given a fully connected overlay distribution graph" as claimed in

Claim 25. Indeed, nowhere does *Haas* discuss determining or utilizing a target bandwidth. Thus, *Haas* fails to cure the deficiencies of *McCanne*.

O'Toole teaches comparing network metrics for subsets of nodes to determine if reconnection of a node to a different parent node in the network will improve performance (see col. 7, lines 44-50). As discussed, *supra*, *O'Toole* does not teach or suggest a target bandwidth of any kind, let alone "defining a target bandwidth having a value equal to half a sum of a minimum link bandwidth and a maximum link bandwidth of edges of the overlay spanning tree given a fully connected overlay distribution graph" as claimed in Claim 25. Thus, *O'Toole* fails to cure the deficiencies of *McCanne* and *Haas*.

The combination of *McCanne*, *Haas* and *O'Toole* teaches bandwidth constraints specified by external policies, a routing protocol for an ad hoc network that employs alternate tree computation algorithms that continually compute backup trees that can be employed to replace failed trees, and comparing network metrics for subsets of nodes to determine if reconnection of a node to a different parent node in the network will improve performance. The combination does not teach or suggest "defining a target bandwidth having a value equal to half a sum of a minimum link bandwidth and a maximum link bandwidth of edges of the overlay spanning tree given a fully connected overlay distribution graph" as claimed in Claim 25. Accordingly, the combination does not teach or suggest all of the limitations of Claim 25.

CONCLUSION

In view of the foregoing, it is believed that all claims now pending patentability

define the subject invention over the prior art of record and are in condition for allowance.

Early and favorable reconsideration of the case is respectfully requested.

Respectfully submitted,

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